CONFIRMED MINUTES

18th Meeting of the International Harmonised Research Activities Side Impact Working Group PART 1

09:30 - 17:00

16-17 May 2003

Nagoya Citizens Auditorium
1-5-1 Kanayama Naka-ku
NAGOYA

1. INTRODUCTIONS

The Chairman announced that Mr Lowne was retiring and would be replaced by Mr Adrian Roberts, also of TRL. The chairman thanked Mr Lowne for his invaluable contribution to the group and noted that he would be sorely missed. Mr Lowne would attend the 2nd day of the meeting in Tokyo to say farewell.

Apologies: Mr Christoph Mueller

Mr Raul Arbalaez – replaced by Greg Dakin

Mr Richard Lowne – replaced by Adrian Roberts

Present: Mr Keith Seyer, DOTARS, Chairman

Mr Mark Terrell, DOTARS, Secretary

Mr Edmund Hautmann, WorldSID Task Group

Mr Greg Dakin, IIHS

Mr Joseph Kanianthra, NHTSA

Mr Minoru Sakurai, JARI

Mr Hideki Yonezawa, MLIT

Mr Akihisa Maruyama, JAMA

Mr Michiel van Ratingen, EEVC

Mr Adrian Roberts, EEVC

Ms Risa Scherer, WorldSID Task Group

Mr Dainius Dalmotas, Transport Canada

Ms Suzanne Tylko, Transport Canada (day 2 only)

2. CONFIRMATION OF AGENDA

The agenda was confirmed as amended in these minutes

3. CONFIRMATION OF MINUTES OF PREVIOUS MEETING

Minutes of the previous meeting were adopted with one minor change.

4. REPORT FROM WORLDSID TASK GROUP

Ms Scherer presented progress with the WorldSID dummy [Document 199].

The biofidelity of the first prototype has been evaluated. The prototype has been further upgraded to improve biofidelity and this will be extended for the pre-production dummies.

Upgrades:

Neck – low biofidelity rating, thought to be due to soft shoulder
Shoulder – damping material thickened
Pelvis – prototype softened – buffers added
Upper leg – too much mass involved in pelvis impact. Changes to femur bone (material, lightened – removed DAS, reduced instrumentation). Femur flesh (increase mass, decoupled from bone)

Biofidelity of upgraded prototype

Complete set of TR9790
Head 5 (fair)
Neck 5.2 (fair)
Shoulder 6.7 (good)
Thorax 7.7 (good)
Abdomen 6.6 (good)
Pelvis 7.3 (good)
Overall 5.7 (original – data corrected) Rev 1 6.5. With head in corridor would be 7.3 with everything but neck meeting requirements.

- A comparison of dummies was presented – values differ from previous published as non-normalised data is used (according to the most recent protocol).
- Note – The BioSID result is Neck test 1 only – Neck test 2 brings results down. Therefore if WorldSID is only compared to tests that have been conducted on previous dummies it will achieve a higher rating.

Pre production dummy design

Alternative neck configurations to be evaluated in parallel with the durability evaluation
Configurations will have stiffer rubber and bumpers
Damping material on abdomen ribs tuned to slightly increase the stiffness of pre-production dummies.
Verification corridors will be defined following testing with pre-production dummies.
Single piece pelvis replaces two piece, with slight increase in stiffness incorporated.
Half arm has been revised to better fit UMTRI shell.
Updated ankle flesh design improves surface profile.
TDAS G5 – standard catalogue product, compatible with standard crash dummy instrumentation.
5 units – 2 spine box. 1 pelvis, 1 each femur. Removable “pocket DAS” to supplement for instrumented arm.

Pre-production – 3 Asia Pacific, 4 Europe. 5 Americas. Delivery began March 2003

11 units have been purchased with minimum of 64 channels DAS & instrumentation. 4 have been delivered and 11 total will be delivered by June 4 2003.

The dummy can be made available to IHRA SIWG members if the group wishes to conduct any specific testing. Pre-production test data will be provided to WorldSID group to establish verification corridors.

Toyota has tested the arm in comparison with Cadavers – it was found to be stiff – further work is to follow.

Full vehicle testing is planned – including a 15deg pole test (IHRA proposed), accident reconstruction (comparison with ES-2).

Mr Van Ratingen suggested testing using chest bands to assess performance under oblique loading. The group supported this concept to establish sensitivity of uni-axial IR-Tracs to off axis loading.

The majority of pre-production tests are to be completed by September 25 (Production freeze)

Production dummies will be available March 2004.

Mr Seyer noted that some governments may use the 50th percentile dummy in barrier tests – therefore it is appropriate to include these tests in validation.

4.1. Funding of small female WorldSID

Chair has written to OICA requesting funding and a response has been received. The response was – "not good news" – an electronic copy of the OICA letter will be placed on website [Document 200].

Ms Scherer advised that from subsequent discussions with OICA the best OICA can do is push for support from its members. US Manufacturers – through OSRP - would fund part of the development cost if other regions also contributed. Contingent on completion of WS 50th. ACEA and JAMA have taken this for consideration. The project is approved through ISO WG 5, TC12, SC22 awaiting funding decision. It is likely to be 4-5 year timeframe to have a production dummy. The required budget is approximately US$4m-5m including scaling, biofidelity testing, prototype and 6 pre-production units.

The group agreed that the Chair would write to OICA advising that funding may be obtained from other sources and thus seeking support for development of 5th dummy. [**Action: Chairman**]

4.2. Mr Van Ratingen presented some detail on funding possibilities for research projects under the new 6th Framework – FP6, from 2002-2006 [Document 201]

The Side Impact project includes 1.6M Euros contribution to development of the 5th %ile WorldSID dummy. There is also funding [2.8M Euros] for full scale testing, validation of IHRA SI procedures and use of 5th %ile WorldSID when available.

5. REPORT FROM IHRA BIOMECHANICS WORKING GROUP

5.1. There is IHRA Biomechanics Working Group status report to be presented at ESV – some members of that group have apparently not seen a draft.
Mr Hautmann noted that the WorldSID group had requested biofidelity criteria from IHRA and that commitment was given for this to be provided at ESV.

Mr Seyer advised that he had sought a copy of the rating system (Chapter X) for discussion but that none was available. There has also apparently been a correction to the format of the data that was presented at the Stapp conference.
There is a meeting of the Biomechanics group scheduled for Friday 23/5 – the outcome of this meeting will be reported at part II of the SIWG meeting.

6. **REPORT FROM EEVC WG13** (to be discussed under Item 8)

7. TEST RESULTS AND TEST MATRICES

7.1. IIHS MDB to Megane [TC]

Mr Dalmotas advised that the vehicle intended for this test has been used for a 208 test and therefore the test is not likely to be conducted for at least 2 years. To be removed from agenda.

7.2. US NCAP load cell wall data - Contour, Focus, Taurus, Volvo S80 [NHTSA]

Mr Kanianthra advised that he has provided this data to Richard Lowne immediately after the previous meeting. [**Action: Secretary to Check**]

7.3. EuroNCAP Pole Impact Data [EEVC] (deferred from December meeting)

Mr Van Ratingen presented data from 5 cars tested in EuroNCAP Phase11 at TNO (perpendicular pole) [Document 202]

- ES1 dummy with ES2 backplate, all LHD
- High HIC on 1 vehicle – head moved around airbag to pole
- Rib deflections for all tests are >42mm in pole test.
- V*C is within limits
- Abdomen force is just above "green" limit for all tests
- Pubic force is low for all

Mr Kanianthra undertook to present data from NHTSA testing with oblique pole at the next meeting (after Tokyo)

8. DETAILED DISCUSSION OF DRAFT TEST PROCEDURES

8.1. MDB Test Procedures

8.1.1. Passenger Car type [AE-MDB]

Mr Roberts advised:

EEVC WG13 has submitted a paper for ESV detailing the specification of the advanced MDB. Mr Roberts made a presentation to the group [Document 203].
Apparently Japan have been developing a revised barrier similar to the AE-MDB, but development has been ceased pending completion of the AE-MDB.

A test matrix for future tests was shown – including load cell wall tests to measure vehicle stiffnesses.

- Recent and future tests are all using ES-2.
- Car-to-car tests to be conducted with Corolla 3-door as target, also Alfa 147.

Mr Roberts also showed some images of a range of test vehicles with the profile of the AE-MDB superimposed to show approximate alignment engagement area [Document 204].

8.1.2. SUV type [IIHS/NHTSA]

8.1.2.1 IIHS Test Program

Mr Dakin presented an update on the IIHS Side Impact Test Program including some results from the first test series. [Document 205]

8.1.2.2 ACEA test results (Christoph Mueller)

ACEA was not represented at the meeting – no presentation was made – deferred to next meeting. [**Action: Mr Mueller**]

Mr Sakurai presented results of full scale tests conducted in Japan [Document 206]. These included one IIHS MDB test. The target vehicle was a Toyota Corolla. The bullet vehicles were Corolla, RAV4, 1Box, AE-MDB and IIHS. A EuroSID Driver dummy was used with a SID IIs in the struck side rear.

The presentation was also made at the most recent meeting of EEVC WG13 in March.

8.2. Pole Impact Test Procedure

NHTSA have conducted some oblique pole impact tests using the ES-2 Dummy with rib slider mechanism. In the most recent 2 tests the airbag has not deployed. Vehicles that have passed FMVSS 201 have failed in the oblique configuration. Some vehicles were also tested in perpendicular configuration with EuroSID and passed, therefore it appears that the oblique configuration is better able to distinguish performance.

Mr Kanianthra will present complete results and conclusions at the next meeting.

9. DISCUSSION OF TEST MATRIX FOR VALIDATION PROGRAM

9.1. Pole impact test

9.1.1. NHTSA have finalised their test procedure with the ES-2 dummy, at 20MPH. The procedure seems to work well, is repeatable and has the ability to load the head and torso. This has been presented to rulemaking – an agency decision is expected by September 2003. Additional research may be undertaken based on the agency decision.

Mr Seyer asked whether the rule should use the WorldSID dummy. Mr Kanianthra commented that NHTSA does intend to introduce WorldSID in time, however prior to introduction of the dummy it would be necessary for NHTSA to conduct extensive

evaluation. They would not start this without a final dummy. The evaluation would likely take 2-3 years. Therefore Mr Kanianthra would not expect to have WorldSID in regulation until 2008-10.

In the meantime NHTSA will complete research on ES-2.

9.1.2. WorldSID Task group – will conduct approximately 3 oblique pole tests. BMW will likely run 2 tests, one with oblique pole and 1 with FMVSS 201 test procedure.

9.1.3. EEVC Plan to undertake at least 2 oblique pole tests, with each of 2 vehicles, plus a numerical study (FEM parametric study of pole position and diameter) and cost benefit study.

9.1.4. Japan is not planning any pole tests. Currently concentrating on Biofidelity tests for WorldSID development and barrier test.

9.2. IIHS Barrier

9.2.1. NHTSA - did some initial evaluation, but have stopped. NHTSA believe test should be crabbed (to load the rear dummy) and do not believe that the IIHS method can be appropriately used in crabbed configuration. NHTSA also do not believe it is appropriate to have a barrier that does not engage the sill at all – even with most SUVs there is some sill engagement.
NHTSA do not plan to do any further work on the IIHS barrier in the short term.

9.2.2. Japan – do not have plans to conduct any tests with IIHS barrier. Plan is not strictly fixed, but IIHS test is not likely.

9.2.3. Europe – not in the short term for development of MDB – some tests planned as part of 6th framework. 3 world car designs using ES-2 and IIHS barrier in comparison with AE-MDB. Also tests of Family car, Mini-car and luxury with the AE-MDB. Comparison of ES1/ES2 to WorldSID.

9.2.4. IIHS – Mr Dalmotas reported that the IIHS next program would be medium passenger cars (e.g Accord / Camry / Focus).

9.2.5. Transport Canada – will continue baseline testing with IIHS barrier and a wide range of vehicles. This will also include WorldSID to see how it compares. Transport Canada is also planning at least 2 accident re-constructions.

9.2.6. The group worked on filling in a matrix of proposed tests for validation of the test procedures [Document 211].
- Ms Scherer undertook to coordinate an OICA response on proposed validation tests as well as feedback on IIHS test procedure.
- There was discussion of the purpose of the validation program, and whether it is possible that one or more test procedures may prove to be redundant in terms of countermeasures required.
- Mr Seyer noted that the matrix suggested that EEVC were not currently planning testing with the AE-MDB and a SID IIS dummy. Mr Roberts suggested that the injury proportion in Europe is close to 50/50 and that EEVC are currently favouring 50th a percentile dummy. Mr Dalmotas drew attention to previous data identifying that the small population are over-represented in side impact injuries from vehicle to vehicle impacts and that this was the case in all regions other than Japan. Mr Sakurai advised that Japan's fatality figures show a slight predominance of male occupants.
- Mr Roberts and Mr Van Ratingen noted that the current development is focussed on the barrier, with the dummy being a tool in the evaluation and that once the barrier design has been completed then further evaluation can be undertaken for the dummy.

10. OTHER BUSINESS

10.1. Access to website

A complete set of documents of the Side Impact Working Group has been loaded onto the website provided by TRL. Currently there is only one username and password for access. The group was consulted as to whether this arrangement was suitable for confidentiality of

commercial information. The consensus was that this arrangement would be suitable in the short term, but that Mr Roberts would investigate the possibility of creating individual logins, and if possible arrange this. Mr Terrell stressed to members that while the single login is used members should keep this confidential and not distribute access beyond the group. [**Action: Mr Roberts**]

10.2. European fleet data

Mr Seyer queried whether light trucks and vans (eg Transit etc) have been included in the European assessment of fleet characteristics. Mr Roberts showed a spreadsheet of sales divided into vehicle categories. Some attempt was made to establish how the categories have been divided, and whether the figures listed for C size vehicles were accurate or included other categories – this was not successful – Mr Dalmotas undertook to take the data for further consideration. [**Action: Mr Dalmotas**]

11. NEXT MEETING (PART 2 - 26/27 MAY 2003 – AFTER ESV)

11.1. Discussion for joint meeting with Compatibility Group.

The agenda for the joint meeting was discussed. It was suggested that Mr Seyer would present the same detail as per the IHRA steering committee report, and that members can add detail where appropriate. The group agreed with this.

11.2. Next meeting (19th) to be held 30/31 October 2003 after the Stapp Conference (San Diego). Mr Kanianthra will investigate a suitable venue. [**Action: Mr Kanianthra**]

12. CLOSE

CONFIRMED MINUTES

18th Meeting of the International Harmonised Research Activities Side Impact Working Group PART 2

09:00 - 17:00

26-27 May 2003

12th Floor Conference Room
Toyota Auto Salon
AMLUX, TOKYO

1. INTRODUCTIONS

Mr Seyer thanked Toyota and the Japanese delegation for arranging meeting venue.

Apologies:

Mr Christoph Mueller

Mr Joseph Kanianthra (replaced by Tom Hollowell)

Mr Michiel van Ratingen

Mr Raul Arbalaez

Present:

Mr Keith Seyer, DOTARS, Chairman

Mr Mark Terrell, DOTARS, Secretary

Mr Tom Hollowell, NHTSA

Mr Minoru Sakurai, JARI

Mr Hideki Yonezawa, MLIT

Mr Akhisa Maruyama, JAMA

Mr Hisaaki Kato, JAMA

Mr Adrian Roberts, EEVC

Mr Dainius Dalmotas, Transport Canada

Ms Suzanne Tylko, Transport Canada (day 2 only)

Mr Richard Lowne, EEVC (Retired – day 2 only)

2. CONFIRMATION OF AGENDA

Former item 7 removed, no new information available to present

Added new item 6 – report from TC.

3. CONFIRMATION OF MINUTES OF PREVIOUS MEETING (for any comments not covered in Part 1 meeting)

3.1. No further comments.

4. REPORT FROM IHRA STEERING COMMITTEE MEETING

4.1. Steering committee met Sunday prior to ESV. Confirmed continuation of working groups for next 2 years. Another meeting of SC to be held at the end of 2003, probably in conjunction with

GRSP in Geneva. The purpose of this meeting is unknown. Concern about progress of the Biomechanics Working Group was expressed at the meeting. The Steering Committee chair undertook to "take this back for consideration"
Mr Seyer advised that he reported on the progress of the SIWG, and the availability of information for members on the website provided by TRL. There was much discussion of event data recorders with a proposal for new working group to be established. This will be discussed at a future meeting with Transport Canada to prepare a paper. Future program of all IHRA working groups is to be discussed at the December meeting.
A matrix of validation tests from the Side Impact working group will be provided to the Steering Committee in December. [**Action: Chairman**]

5. **REPORT FROM IHRA BIOMECHANICS WORKING GROUP** (BWG meeting held between SIWG Parts 1 and 2)

5.1. Meeting was held in Nagoya – some sections of the report have been completed: Accident Data, Anthropometry, and Injury Criteria. Large tasks ahead – Biofidelity method, construction of corridors, outline of test matrix to be recommended, as well as rating procedure. Individuals have been assigned specific tasks – should have a draft by September. The next meeting will be held in conjunction with the IRCOBI conference.

6. UPDATE FROM TRANSPORT CANADA – STIFFNESS OF MDB, MORE RECENT TESTS WITH BASELINE VEHICLE

Brief update-

Transport Canada presented a side impact research update [Document 209].

Issue raised by EEVC regarding stiffness of barriers – in particular stiffness of IIHS barrier. Previous programs limited to about 1500kg for harmonisation.
Validation revised with new bullet vehicles, all with standard Camry Target: LandRover Freelander (1850kg), Toyota Tacoma (1850kg), retest of IIHS barrier also at 1850kg. Incremental increase in intrusion with heavy barrier – corresponded closely to intrusion from Freelander. Images of Freelander post test, damage only to bumper element and some sheet metal, no damage to structure. The stiffness of barrier is not significant in comparison to resistance that can be generated by the target car.

Mr Seyer questioned whether it is possible to change initial stiffness of vehicle front to reduce intrusion velocity at time of injury – rather than final intrusion. Mr Dalmotas noted that it is geometry effects that have the major influence. He does not believe that IIHS element stiffness is too far from representative. This will not be measured in a rigid barrier test. Mr Seyer noted that side structures have become significantly stiffer, therefore it may be possible to change initial stiffness of bullet vehicle such that intrusion velocity is reduced prior to contact with occupant (with a view to joint group discussions on Tuesday). Mr Dalmotas noted that current work is purely with regard to stiffness of regulatory element, and relevance of the stiffness of the IIHS element.
Mr Hollowell noted that NHTSA are focussing their compatibility work for good interaction all around the vehicle.
Mr Dalmotas noted that with the SID IIs dummy which is located in front of the B-pillar, softening of the barrier can actually increase loads on the dummy, because of the wrapping effect around the B-pillar. The "dimple" effect was noted previously by Mr Lowne.
Mr Hollowell advised that NHTSA testing has found the IIHS barrier to be softer than LTVs in the bumper area (producing lower dummy injuries in the lower body region) but much stiffer in the upper area (producing high injuries in upper body regions).

There was extensive discussion about the merits of tuning of barrier stiffness, applicability of a worst case test, pole tests vs barrier tests, firing and non-firing of airbags, door velocity, momentum transfer, protection of rear occupants.

Mr Kato commented that for Toyota's testing of the IIHS barrier the chest and abdomen deflection are severe compared to the average SUV which has a lower intrusion profile, pushing the pelvis. The upper part of the door with the SUV is not as high as with the IIHS barrier. The SUV used was a Hilux 4-Runner.

Mr Dalmotas also showed a test with the Volvo XC90 as a bullet vehicle. This recorded very high injury numbers, including upper ribs and shoulder, with very major deformation of the target vehicle (2000 Camry).

Mr Hollowell advised that the process that NHTSA use to justify barrier selection suggests that some revisions to the barrier definition may be necessary. He showed some results from the NHTSA testing [Document 208] with 3 target vehicles, using the 214 test procedure. For 1 vehicle this was also tested using the Side NCAP procedure. The rib deflections were approximately within test variation. IIHS barrier also generated high HICs compared to the F150, using ES-2. In the 214 test procedure the pubic symphysis force was also high with the IIHS barrier. The ES-2 used was pre-modification, however on analysis NHTSA believe the results to be valid.

Mr Seyer commented that he understood that the group had recommended two barriers (IIHS and AE-MDB) which would be subject to validation and that NHTSA seem to be seeking to define a barrier from scratch. Mr Seyer asked whether it is possible that NHTSA will further pursue evaluation of the IIHS barrier and it's applicability to the test procedure. Mr Hollowell noted that NHTSA are happy with the concept of the barrier, but have some difficulty with the details.

Mr Seyer pointed out that there are currently two test proposals – and that at present Canada and the US are seeking a LTV type barrier, which Europe and Japan are not likely to include this. The planning of a test matrix to conduct further tests to fill in any gaps to address NHTSA's concerns. Mr Seyer suggested that Transport Canada could conduct tests with one vehicle from NHTSA's series (eg Maxima) to assist this. Mr Seyer suggested that it would be beneficial for the reports from the group that if there is dissent or disagreement from NHTSA on the test procedures, this should be identified "up front".

Mr Seyer asked that Mr Hollowell advise a suitable bullet vehicle for a test to be run by Transport Canada. Mr Hollowell pointed out that this test would be perpendicular, whereas NHTSA favour a crabbed configuration. Mr Hollowell advised that he would try to achieve this and that Randa Samaha would liaise with Ms Tylko with a view to what tests TC can run to push things forward. [**Action: Ms Samaha and Ms Tylko**]. Mr Dalmotas also pointed out that there have been concessions in the barrier definition for the purpose of harmonisation, and that a worst case test is still a possibility. If all IHRA constraints were removed parameters such as the mass would be increased. Mr Seyer noted that the requirement for the group is to harmonise where possible without degrading safety.

Mr Sakurai noted that while Japan is primarily interested in the AE-MDB test, they are looking at the IIHS and pole tests as a secondary priority.

7. **REPORT FROM EEVC WG13** (to be discussed under Item 10)

7.1. EEVC Headform

This is being considered at EEVC Working Group 13. They have found that headforms being used by some institutes have a different profile to those originally used by the EEVC. Mr Seyer noted that Mr Kanianthra had previously undertaken to compare the EEVC test procedure to that of FMVSS 201 for use in the IHRA test procedure. Mr Hollowell undertook to follow this up with Mr Kanianthra. [**Action: NHTSA**]
There is a modified version of the EEVC procedure – DOTARS to check whether this has been provided to SIWG members. [**Action: Secretary**] Comparison to be revisited with revised test proposal. Mr Roberts advised that the proposal will be further discussed at a meeting in July. Mr Seyer suggested that if Mr Kanianthra's comparison has not been done, that it would be best to wait until after the July meeting before commencing further work. It is necessary to have the comparison before defining a test matrix for evaluation.

8. ACCIDENT STUDIES

8.1. Non-struck side injury distribution [TC] (deferred from December meeting)

No further information was available from Transport Canada – to be completed for next meeting – Mr Hollowell suggested that TC talk to Randa Samaha [Action TC]

Mr Roberts noted that some members of the EEVC working group are not convinced that there is a significant injury problem with non-struck side - requested data from TC – [**Action: Mr Dalmotas** to follow up].

9. DETAILED DISCUSSION OF DRAFT TEST PROCEDURES

9.1. Interior Headform Test Procedure [EEVC]

9.2. OOP Test Procedure [TC]

The test procedure document is complete – changes have been made to improve test setup descriptions and better describe calculation methods. The final document has not been distributed but should be available in June.
Mr Hollowell advised that in consideration of introduction of the pole test NHTSA would likely consider mandating TWG test requirements. Some manufacturers had advised that they met the voluntary requirements, but subsequently were found not to have tested. Mr Hollowell advised that NHTSA had suggested extra tests, but that these had been ignored. Ms Tylko noted that the data had not been ignored, but that the extra tests had not been included as no additional benefit was gained – this had been confounded by some errors in presentation / compilation of the data. [**Action: NHTSA / TC** to confirm and advise]

Mr Roberts advised that EEVC have not discussed OOP tests at all. This is a low priority and there is concern as to whether this procedure is necessary. The EEVC were asked to confirm whether there are any plans for work under the 6FP. [**Action: Mr Roberts**]

Mr Sakurai advised that there are no plans within Japan to evaluate this test procedure. Mr Maruyama advised that some individual Japanese manufacturers are conducting tests.

10. DISCUSSION OF TEST MATRIX FOR VALIDATION PROGRAM

Some additional items were added to the test matrix developed in Part 1 of the meeting, specifically on the Pole test and Out-of-position tests. [Document 210]

Mr Roberts asked if it would be possible to distribute the OOP procedure and the proposed pole test procedure within Working Group 13. Ms Tylko advised that the current OOP procedure (without the slight changes to be released shortly) has been available on the IIHS website for some time, and can therefore be distributed freely. Mr Seyer noted that NHTSA have not provided the Pole test procedure in a Government Industry Meeting, but that most details have been included in the SIWG ESV paper. Mr Roberts suggested that the NHTSA procedure would be more useful for comments from WG13, and requested to distribute this within WG13. Mr Hollowell advised that this would be acceptable, provided that confidentiality is maintained within the EEVC working group and that it is clear that the document is a draft.

11. JOINT DISCUSSION WITH COMPATIBILITY WG

Mr Seyer will give overview of group position based on ESV presentation including list of proposed test procedures. Members can provide further detail if required.

12. OTHER BUSINESS

None

13. NEXT MEETING

The next meeting (19th) of the IHRA Side Impact Working Group is proposed to be held on 30/31 October 2003 after the Stapp Conference (San Diego). Mr Kanianthra will investigate a suitable venue.

The time and place of the following meeting was discussed, Mr Seyer suggested late February / Early March 2004 in Australia, to be held back–to–back with the Compatibility working group. The possibility of a meeting after the IHRA steering committee meeting was raised, in order to discuss the recommendations of the Biomechanics working group – no additional meeting has been planned at this stage.

14. CLOSE (End of Day 1; Day 2 to be Joint Meeting with IHRA Compatibility Group)

15. JOINT MEETING WITH COMPATIBILITY GROUP

On 27 May 2003 a Joint Meeting was held with the IHRA Compatibility Group.

The following notes were taken at the meeting:

15.1 Introduction – Thanks to Toyota and Japanese delegation for organizing venue.
Farewell to Richard Lowne.

15.2 Update on the findings of the Side Impact Working Group

Mr Seyer presented a report based on the presentation to the IHRA steering committee immediately before ESV in Nagoya.

- Group work started with collection / compilation of accident data from each region.
- Interacting with other groups – WorldSID Task Group, IHRA Biomechanics WG, IHRA Compatibility group – requirement for harmonized test devices and need to ensure that design changes for one area do not compromise another.
- MDB test – challenging due to differing fleet composition around world. LTVs large proportion of Nth Am fleet, small LTVs increasing in rest of world.
- 2 tests, 1: AE-MDB, based on Advanced European MDB, new element (representative of car), small female dummy, targeted 250mm rear of R-point. Trolley mass 1500kg. Design frozen by 10/03. Geometry based on studies of vehicle fleet.
- Test 2 based on IIHS barrier.
- Pole test – moving vehicle to pole with oblique impact at 15 deg. 31 km/h Evaluate head and thorax with mid – sized male dummy
- Out-of-position side airbag evaluation – ISO TR14933 – standard set of procedures for restrained and unrestrained occupants, using Hybrid III 5%, 3 yo 6yo + SID IIs
- Sub-systems Interior Headform Test – based on FMVSS and EEVC test procedures – impact points for side impact, possibly non struck side.
- WorldSID dummy – regulation ready end first quarter 2004.
- WorldSID 5th – some funding available, not expected to start until 2005.
- Next steps – finalise details of all test procedures, guide validation phase for test procedures between 2003 and 2005. Awaiting dummy recommendations from BWG. Consideration of "worst case" MDB test. Look into developing tests procedure for non-struck side injuries. Draft Global Technical Regulation for side impact protection for consideration at WP29.
- Mr Hollowell noted that Pelvis injury would be also included in the pole impact test. Undertook to advise group when NPRM is released.
  Transport Canada showed some footage of comparative side impact tests using the WorldSID and ES-2.

15.3 Update on the findings of the Compatibilty and Frontal Impact Working Group

Mr O'Reilly presented a report based on the presentation to the steering committee and ESV conference.

- aims to develop internationally agreed test procedures – primarily frontal,
- Europe closer to number of Light Goods vehicles than previously assumed.
- Compatibility not simply mass, geometry and stiffness are at work.
- Possible test procedures – Full width, ODB, Compartment strength test ODB, Progressive Deformable Barrier – constant speed, PDB Constant Energy, …
- EEVC have two possible suites of test.

15.4 Aspects common to both groups

Mr Seyer raised the initial stiffness of vehicles, discussed at Monday's SIWG meeting.
Mr Prasad noted that the amount of front space that could be dedicated to a soft area was limited, as front space is at a premium – 100mm might be OK, 150mm would not be acceptable.
Mr Zobel suggested that the impact of protection protection measures on side impact performance should be measured. Also that if the deformable area is too soft it will be deformed by the door, and therefore not provide any benefit.

Mr Hobbs noted that the interaction is complex and therefore a uniform soft front may be non desirable as it would deform at the B-pillar and potentially cause more intrusion at the doors.
Mr Prasad suggested that Ford could conduct some quick modeling to investigate the effect of increasing depth of foam on performance.
Mr Hollowell advised NHTSA study showed stiffness (Summers definition) had a statistically significant effect for LTV to car in frontal crash, but not car-car. For side crash the stiffness had a statistically significant effect for Car-Car but not for SUV – Car. This makes sense as the stiffness ratio of LTV front to car side is great enough to outweigh changes in the individual vehicle stiffness.
Mr Prasad expressed a concern about tests that might drive an increase in peak accelerations for lower speed impacts, as there is a significant proportion of fatalities at under 30 Mph and there is an aging population that become more sensitive to high accelerations.
Mr Dalmotas presented some research from TC on opportunities to enhance partner protection.

- lowered IIHS element for engagement of door sill – Camry target vehicle – significant change to final intrusion profile, dummy responses (SidIIS) no major change in deflection – some up a little, some down
- repeated with Civic Coupe – has a reinforced B-pillar – also not great change in rib deflection measures. Mr Seyer queried whether the similar values are a result of the armrest design of this vehicle – Mr Dalmotas suggested that this was a possibility.

Mr Hobbs showed some photographs from a Side impact compatibility evaluation conducted by TRL – using deformable barriers with varied shape. Target cars were old generation – pre side impact design.
Mr Zobel mentioned some testing conducted by Eucar (car to car tests) – changed mass made little difference, also added low load path (blocker) showed no advantage. Modification to more planar front did show an advantage. Lowering of bullet vehicle showed some advantage. There are no recommendations coming from this program. Suggest that some computer simulation is necessary to further understand the mechanics involved.
Mr Lowne queried whether compatibility measures would do anything to prevent front corners of vehicles becoming stiffer and thus increase punch in effect in angled impact.

15.5 Future research plans in each group

Mr Terrell displayed the matrix of validation tests generated in the recent meeting of the SIWG.
Mr Hollowell advised that NHTSA are undertaking further development of their FE models of a range of vehicles in order to run an optimization for harm reduction.

15.6 Open discussion